Meeting Date: September 27, 2004
Date Prepared: September28, 2004

MULTI-AGENCY RADIATION SURVEY AND SITE INVESTIGATION MANUAL (MARSSIM) WORKGROUP MEETING NOTES

MONDAY, SEPTEMBER 27, 2004

ATTENDEES:

U.S. Environmental Protection Agency - OSWER/ERT-West: C. Petullo
U.S. Environmental Protection Agency - Headquarters: K. Snead
U.S. Environmental Protection Agency - Headquarters: L. Bender
U.S. Environmental Protection Agency - NAREL: V. Lloyd
U.S. Environmental Protection Agency - Region II: N. Azzam (by phone)
U.S. Nuclear Regulatory Commission - RES: R. Meck
U.S. Nuclear Regulatory Commission - NMSS: J. DeCicco
U.S. Air Force: R. Bhat
U.S. Air Force: Major C. Bias
U.S. Navy: S. Doremus
U.S. Department of Energy (DOE/EM): A. Williams
U.S. Department of Energy (DOE/EH): E. Boulos
U.S. Department of Homeland Security: C. Gogolak

MEMBERS OF THE PUBLIC:

Cabrera Services, Inc.: S. Hay (U.S. Air Force Contractor)

DISCUSSION

C. Petullo opened the meeting, and the Workgroup reviewed the agenda. Workgroup members provided updates on MARSSIM-related activities within their agency.

J. DeCicco provided a handout describing NRC's development of regulations for disposition of materials and equipment (M&E). NRC is using the phrase "Disposition of Solid Materials" in place of "Clearance," and is considering options for the form of the regulation:

a) retaining the current approach using measurement-based guidelines (i.e., Reg Guide 1.86),
b) modify regulations to:
    I) restrict release to certain authorized paths (e.g. RCRA C landfills),

ii) allow release to only licensed waste-disposal facilities, or
iii) allow release with no limitations (clearance) based on survey results.

There is no official position on the final form of the rule, but NRC is strongly considering option b(I) using concentrations from IAEA Safety Guide RS-G-1.7 in place of NUREG-1640. The basis for Safety Guide has not been published, but includes modeling potential release scenarios similar to NUREG-1640. Some of the modeling assumptions (e.g., the size of a truck) are different, but the Safety Guide provides volumetric and surficial concentrations for individual isotopes. The Safety Guide is scheduled to be published next year. Texas is developing new regulations, and NRC suggested that they use the IAEA standards as the basis for their new regulations.

The current schedule calls for the NRC staff to deliver a rule making package to the Commission in March 2005. The rule is expected to be released for public comment sometime in mid-2005.

A. Williams informed the Workgroup of a Task Force investigating the use of EPA's PAGs for the release of real and personal property following the use of a radiological dispersal device (RDD). The Task Force is coming up with numbers, not a methodology for demonstrating compliance with the numbers.

Argonne National Laboratory has been tasked with replacing the occupational limits in Table A of 10 CFR 835. These numbers will be applied for moving M&E from control zones to buffer zones. DOE currently has no regulations for releasing M&E from buffer zones. A. Williams believes that MARSSIM (and the MARSAME supplement) will be explicitly or implicitly listed as guidance for release in 10 CFR 835.

A. Williams also informed the Workgroup that the RESRAD-BIOTA code has been released to assist in performing ecological risk assessments.

R. Bhat told the Workgroup about a thorium site the Air Force is releasing. The DCGL was revised from 1.2 pCi/g to 5.3 pCi/g based on site-specific information. The budget for the project was reduced by $6 million, and the current project budget is requesting only half as much money versus the 1998 budget. R. Bhat believes this is due to the use of MARSSIM.

The Workgroup discussed the possibility of performing a pilot study to evaluate the guidance in the MARSAME supplement, similar to the MARSSIM pilot study performed by the NRC in Oklahoma. Suggested locations included Nellis AFB in Las Vegas, NV and Hunters Point Naval Shipyard in San Francisco, CA. This discussion was added to the parking lot for future discussion.

The ISCORS meeting scheduled for October 28, 2004 has a discussion of MARSSIM on the agenda. The Workgroup scheduled a conference call for October 12, 2004 to discuss preparations for the ISCORS meeting.

"SPANISH MARSAME"

The Workgroup briefly discussed the "Classification Method for Scrap Iron from the Jose Cabrera Nuclear Power Plant" (Spanish MARSAME) distributed by the NRC for review. C. Gogolak pointed out that the MARSSIM - MARSAME Crosswalk has many of the same issues. This overlap will allow the Workgroup to discuss the technical review of the Spanish MARSAME during the Crosswalk discussions.

The Workgroup discussed several aspects of the Spanish MARSAME that were different from what was currently planned in MARSAME. The Spanish MARSAME:

- Includes a Class 0 for M&E that are obviously radioactive waste.
- Discusses surrogates in more detail than MARSSIM, including suggestions on expected ranges (line 938).
- Includes a modeling approach using scaling factors (shape factors) to convert surface activity to volume (pages 46-47) that allows the user to estimate volumetric activity based on surface measurements.
- Suggests performing one measurement for every 166 Liters of volume, or five measurements per cubic meter, but does not provide a basis for this sampling density.
- Provides a suggested number of measurements (N), calculates a variability based on survey results ( ), and evaluates . If is too large the M&E cannot be released (Pages 54 and 55).
- Calculates an Area Factor by working backwards from a sum of fractions (line 1954).
- Chapter 13 has a discussion of documentation which requires more paperwork than MARSAME is considering.
- References ISO documents on MDC that need to be reviewed for use in MARSAME (ISO 11929-1 to 11929-9).
- References EPA document on the potential recycling of scrap metal from 1997 (superceded in 2001)and is available from EPA on the Internet at http://www.epa.gov/radiation/docs/cleanmetals/tsd/scrap_tsd_041802_vol1cvr_toc1.pdf
- Allows release of Class 2 and Class 3 M&E with less than 100% measurement.
- Does not discuss data quality assessment in detail.
- Uses the range of fluctuations on an analog meter to provide an estimate of standard deviation in the measurements (N. Azzam pointed out the range of meter fluctuations is dependent on the instrument time constant, e.g., fast or slow setting).

This provides a list of major topics for Workgroup members to consider during the technical review of the Spanish MARSAME.

MARSSIM - MARSAME CROSSWALK

The Workgroup continued discussions on the crosswalk from the August 5 and August 10 conference calls. The discussions started with a review of the status of topics discussed during the conference calls.

Item #1 - Surface-to-Volume Ratios

The discussion of segregation of M&E in Chapter2 needs to include separating M&E based on shape as well as other factors (e.g., type of material, background, inherent value). The segregation discussion needs to focus on not combining M&E that are not similar, and stay away from the need to separate dissimilar M&E. A. Williams pointed out there may be a cutoff based on inherent value related to surface area. For example, foil has a large surface area relative to the volume and has less inherent value compared to blocks of metal. Blocks of metal have a smaller ratio of surface area to volume.

Item #2 - Difficult-to-Access Areas

At the May meeting the Workgroup decided MARSAME is primarily concerned with measurability, not accessibility. Accessibility may be one of several factors that affects measurability. A global change will be made to change difficult-to-access areas to difficult-to-measure locations in MARSAME.

Item #3 - Survey Unit Size and Classification

The maximum survey unit size will be provided by the model used to develop the action level, the text of the regulation, or the regulator issuing or supporting the selected action level. A table of survey unit sizes for various regulations and action levels should be included in the Action Level Appendix. In MARSSIM the recommended Class 2 survey unit size was selected based on the modeling used to develop the DCGL. The size was reduced for Class 1 survey units and increased for Class 3 survey units to adjust the measurement density. The Workgroup did not come up with a technical basis for adjusting survey units sizes in MARSAME, although it is always acceptable to reduce the survey unit size below the maximum.

The Workgroup discussed the need for classification, and the basis for classification of different areas. R. Meck asked the members to consider the case of a steel plate. If the activity is uniformly distributed and the activity is known to be less than the action level, the plate can be released if less than 100% of the plate is measured. This represents a Class 2 or Class 3 situation. The Workgroup agreed that this example demonstrates that it is possible to have surveys that require less than 100% measurement of the M&E being investigated. Class 1 surveys are required to measure 100% of the survey unit, and if samples are used to demonstrate compliance they must be collected on a grid. Class 2 M&E must be 100% measurable, but only 10 to 100% of the M&E needs to measured as part of the disposition survey with process knowledge or historical information providing the justification for the reduction in survey effort. If less than 100% of the M&E are measured, the measurements need to be distributed across the

M&E like samples on a grid. Class 3 M&E need to be 100% measurable, but scans are only performed at judgmental locations. Samples and direct measurements are performed at random locations. If the activity is homogeneous and inaccessible (e.g., paint over alpha activity) only the locations that will be measured for Class 1 and Class 2 surveys need to be made accessible (i.e., only strip paint from locations where measurements will be made). If measurements are performed in judgmental locations, the locations need to be representative of the M&E or biased to locations with the highest potential for radioactivity. Classification will be consistent with MARSSIM. The Workgroup did not come up with a technical basis for different levels of survey effort based on classification.

The Workgroup discussed some examples of how classification could work in MARSAME. If a tire is a survey unit there could be a difference in contamination potential between the top of the treads, grooves, sidewalls, belts, and inside of the tire. While the belts and inside of the tire will be considered non-impacted under normal operating conditions, the top of the treads and the sidewalls will probably have a low potential for contamination while the grooves may have a higher potential, depending on the project. Multiple activity levels within a single survey unit can result in greater variability, making it more difficult to make a technically-defensible disposition decision. The tire would have to be classified according to the highest potential for classification, so the activity associated with the grooves could determine the overall classification. The grooves are difficult to measure, so any survey design will need to ensure the measurements are representative of the entire survey unit.

The supplement should clearly state that surveys should not ignore common sense. Users always have the option of discussing problems with regulators and other stakeholders. One of the goals of the MARSAME is to allow flexibility when designing disposition surveys.

Item #4 - Small Areas of Elevated Activity (Hot Spots)

In MARSAME the focus is on the average or total activity in a survey unit, and small areas of elevated activity are generally not an issue. If the regulation stipulates performing a survey for small areas of elevated activity, it should also provide the area factor. The elevated measurement comparison becomes an issue for regulatory compliance, but not for estimating dose or risk. For implementation, the MARSAME user can assume an area factor of one for most survey designs.

Items #5 and #6 - MQC

R. Meck described a situation where a single utility owned two power plants. The release criteria for the two plants was the same, no detectable radioactivity above background. M&E was released from the first plant using one SOP, transferred to the second plant where it was surveyed into the plant using an interdiction survey. The second plant used more sensitive measurement methods and discovered activity that was not detectable by the methods used at the first plant. MARSAME should provide guidance on determining MQCs that allow the user to avoid this situation.

Items #7 and #8 - Measurement Locations and Coordinate Systems
It may be impossible or impractical to establish a grid and assign measurement locations. This could lead to problems with representativeness and independence of measurements. Marking locations where measurements were performed may also be a problem. Permanent markings may not be possible. This issue may be less important for 100% measurement surveys of average activity, and more important for MARSSIM-type surveys where less than 100% of the survey unit is measured. The Workgroup added this concern to the Parking Lot for later discussion, and possibly develop a write-up on "Good Practices."

Item #9 - Survey Designs with No Scanning
There are situations where scanning may not be possible. There may not be an appropriate scanning technique available for difficult to detect radionuclides (e.g., alpha and weak beta emitters, electron-capture decay), or site-specific conditions may prevent scanning. The ELIPGRID code can be used to calculate the probability of failing to detect an area of elevated activity with a specified size and shape. Guidance on using ELIPGRID needs to be incorporated into MARSAME.

Item #10 - Usability of Swipe Data
Swipes do not provide quantitative estimates of radioactivity. Swipes that identify the presence of loose radioactivity may be useful for developing lists of radionuclides of concern and identifying locations requiring additional investigation. The Workgroup discussed the potential use of swipe data and determined that swipes require a warning similar to sentinel measurements: they provide some qualitative data but cannot be the only information used to support a non-impacted decision or a clearance decision.

Item #11 - Are Sentinel Measurements Performed During Scoping Surveys?
The definition of sentinel measurements states they support the objectives of the IA. The IA includes the decision of whether M&E are impacted, as well as scoping, characterization, and remedial action support surveys performed prior to final selection of a disposition option. Additional discussions on sentinel measurements and when they are performed occurred on Thursday, September 30.

Item #12 - Survey Documentation
In MARSSIM all survey designs are documented in a survey plan. MARSAME will allow the use of SOPs and checklists for routine disposition surveys. Examples of routine disposition surveys include release of tools and equipment from a controlled area, and rad waste surveys.

The Workgroup discussed the possibility of including an "early out" in MARSAME. C. Bias pointed out that there are situations where disposition surveys may not be required. For example, the M&E being investigated are obviously contaminated and the existing historical data meet the requirements of the waste acceptance criteria at the disposal facility. MARSAME should allow the user to proceed directly to disposal without additional data collection. This

type of option needs to be added to the flowchart in Chapter 1 and described in more detail throughout the supplement. N. Azzam stated that one location to make this point is in Chapter 2 in the discussion of categorization. If there is sufficient information to support a non-impacted categorization, no additional investigation is required. S. Doremus stated that a decision can be included in the DQO Process on whether there is sufficient information to support a disposition decision before collecting addition data. C. Bias raised the question of whether or not the early out could be applied to interdiction surveys (e.g., receiving materials from a trusted manufacturer so no survey required, renting equipment from a trusted company or renting brand new equipment). V. Lloyd warned about potential problems associated with reuse of M&E released with the early out process. The description of the early out process needs to be precise and include idea of stewardship to avoid losing the audience. The Workgroup discussed the concept of a "MARSAME Survey" as a survey designed using the guidance in Chapters 3 and 4. Anything else, including the early out, would not be considered a MARSAME survey. This approach seemed to lead to a single survey design, or possibly separate designs for the individual disposal options. R. Meck pointed out that there may be an assortment of M&E being investigated. Some M&E may selected disposal as rad waste as the disposition option very early in the process. For other M&E, the selection of disposal as rad waste for the disposition option may not come until later in the process. It is also possible to design a release survey such that if the M&E fail to be released there will be sufficient information to demonstrate compliance with the waste acceptance criteria. All these options should be considered when designing a disposition survey. C. Bias suggested multiple planning "loops" of the DQO Process. For example, there could be one planning loop for categorization, one for scoping and characterization, and one for disposition survey design. MARSAME should include an "early out" whenever you have sufficient information to support a disposition decision. The result of the discussion was to include the idea of not performing a survey of there was sufficient information available to support a disposition decision. Addition of a "Class 0" to describe M&E that will be disposed of as rad waste is inconsistent with MARSSIM and will not be used in MARSAME.

The Workgroup discussed whether or not MARSAME should provide guidance for waste disposal surveys. R. Meck requested that any discussions of disposal as radioactive waste recommend the user implement existing SOPs, and that the modifications to the flowchart specify non-disposal options. K. Snead pointed out that waste disposal is simply a different disposition option with different action levels. The Workgroup had a brief discussion on waste acceptance criteria. Some criteria are very detailed and very descriptive, such as those applied to waste entering the WIPP. Waste acceptance criteria at RCRA landfills tend to provide more flexibility. C. Gogolak stated that in many cases the waste acceptance criteria are to certify the waste is below a certain number of Curies. Signing a certification is simpler than performing a survey, so non-radioactive M&E are being sent to landfills. Including waste disposal as a disposition option in MARSAME draws attention to the need to follow the survey planning process even for disposal and early out cases.

Item #13 - Source Geometry
In MARSSIM the source geometry present during the final status survey is the same geometry that will deliver future dose. In MARSAME the M&E could be used for something completely different in the future, so source geometry during the disposition survey may not be related to potential future use. The potential future use (i.e., disposition option) is related to the survey unit size as a function of the action level. Source geometry needs to be considered during segregation of M&E during the IA.

The Workgroup also discussed the source term and how it could impact classification and survey design. For the example of the tanks used as targets for depleted uranium (DU) rounds, the source term can be used to support conclusions about the entire tank. If the amount of DU in each round is known, the total mass of DU in the tank can be estimated based on the number of "hits" (i.e., count the number of holes in the tank). The mass of DU and the mass of the tank provide an upper bound for the concentration of DU in the metal. This can also apply to estimates of residual contamination on equipment if the concentration of the radionuclides of concern in the soil (or other matrix of concern) are known. If the average or conservative upper bound estimate of activity in soil shows that a kilogram of soil would need to get past the air filter before the engine could be considered contaminated, this information should be used to help design the disposition survey.

Item #14 - Class 0 for Rad Waste
The Workgroup decided that there would be no "Class 0" in MARSAME, but there would be guidance for an "early out" based on existing data. MARSAME will recommend using bounding assumptions to eliminate or reduce the need for additional investigation, such as surveys. All impacted areas require some type of measurement. In some cases it is possible to "spot check" impacted M&E and make a disposition decision based only on judgmental measurements, and not require random measurements in all cases.

Item #15 - Survey Design
If Class 1 M&E are scanned 100% and the scan MDC is less than the action level the M&E can be released (i.e., demonstrate compliance for selected disposition option). If Class 1 M&E are scanned 100% and the results are data logged to provide documentation and the average is less than the action level, the M&E can be released (requires documentation).

The Workgroup discussed the use of area factors and accounting for small areas of elevated activity using the elevated measurement comparison (EMC). If the area factor is 1 there is no problem, since all of the measurements are below the action level when there are no hits and the M&E can be released. Similarly, when the disposition criterion is stated in terms of total activity small areas of elevated activity do not need to be considered. In all other cases MARSAME needs to provide a performance-based approach emphasizing the proper estimation of the MDC for the measurements being performed. During survey design the planning team must consider

all inputs to the MDC and provide a defensible concentration that can really be detected 95% of the time.

EPA'S LOW ACTIVITY WASTE EFFORT

D. Schultheisz of EPA presented information on the advanced notice of preliminary rule making (ANPRM) on disposal of low activity waste in RCRA landfills. Copies of two presentations were provided to the Workgroup: An Overview of EPA's Low Activity Waste Effort, and An Overview of Public Comments on EPA's Low Activity Waste Effort.

EPA is considering proposing an integrated approach to the disposal of low activity radioactive waste. This effort is focused on identifying the hazards associated with low activity radioactive waste and determining acceptable disposal options. There are problems with the disposal of mixed RCRA and NRC wastes and the variety of regulations governing TENORM. Exempt quantities of radioactive materials and TENORM could be disposed of in RCRA landfills. NRC's clearance rule could serve as a baseline for determining what can be disposed of in RCRA landfills.

There have been a wide range of comments from several different groups. Members of the public are primarily concerned with avoiding the appearance of removing NRC from the disposal loop, resulting in an apparent deregulation or failure to regulate radioactive waste. State regulators are mixed, about half agree with the concept while the other half are opposed. The States do not want additional regulatory requirements imposed that will cost additional money to implement and enforce and the increase in the number of locations where significant amounts of radioactivity are stored. Costs to generators should not impact this proposed rule making. Waste generators are hoping for a reduction in disposal costs. Landfill operators are mixed; some will probably accept low-activity radioactive waste while others will definitely not.

Surveys will be required to ensure that large quantities of radioactivity will not be improperly disposed of in RCRA landfills. The ANPRM is looking at types of surveys, certifications, use of verification surveys, and using quick non-invasive surveys to monitor compliance. MARSAME would be the guidance on designing surveys to demonstrate compliance with future regulations.

ADJOURN

Meeting Date: September 28, 2004
Date Prepared: October 2, 2004

MULTI-AGENCY RADIATION SURVEY AND SITE INVESTIGATION MANUAL (MARSSIM) WORKGROUP MEETING NOTES

TUESDAY, SEPTEMBER 28, 2004

ATTENDEES:

U.S. Environmental Protection Agency - OSWER/ERT-West: C. Petullo
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MARSSIM - MARSAME CROSSWALK (Continued)

Item #15 - Survey Design
The Workgroup continued discussions from the previous day, starting with a discussion of options for area factors. Always assigning an area factor of 1 is conservative. Disposition criteria based on total activity (e.g., NUREG-1640) imply a theoretical area factor of infinity, but for Class 1 M&E this isn't an issue since 100% of the M&E need to be surveyed. Neither of these approaches allow any flexibility based on the area or volume of elevated activity.

C. Gogolak pointed out that the survey unit size for Class 1 M&E doesn't matter since 100% of the M&E need to be surveyed. If small areas of elevated activity are identified, they can be cleaned (remediated) and resurveyed as part of the disposition survey process.

100% of accessible areas must be physically measured. If there are inaccessible areas where the activity levels are less than or equal to the activity in the accessible areas, the inaccessible activity may be estimated based on the known relationship. The Workgroup discussed whether physical measurements are required in inaccessible areas where the activity is expected to be greater than the activity in accessible areas, or when there is no known relationship between the activities in accessible and inaccessible areas. The Workgroup did not come to consensus on this topic.

The Workgroup agreed that MARSAME guidance should start with the assumption that the default survey design for all impacted M&E is 100% measurement where a meter is physically placed on every surface. Flexibility is provided by allowing the user to physically measure less than 100% of every surface based on process knowledge, level of activity relative to the action level, and other factors including classification. Estimates or predictions of what will not be measured is required. Individual objects can have multiple classifications (e.g., Class 1 on outside surfaces and non-impacted on inside). S. Doremus proposed a diagram to illustrate this concept and assist in defining the term "measurable" (see Figure 1). The percentages in the boxes are only examples and do not reflect actual recommendations (except for the reduction in physical measurements as you go from Class 1 to Class 3 M&E). Non-measurable areas are not an option in MARSAME. Difficult-to-measure areas may not be physically measured, but there will be some method available for inferring activity in areas where physical measurements are not performed.

Class		1	2	3
Measurable	Physical	100%	10 to 100%	1 to 10%
	Inferred	0%	0 to 90%	90 to 99%
Non-Measurable		0%	0%	0%

Figure 1. Survey Design Options

The Workgroup also discussed the role of the IA in survey design. The concept of an "early out" based on the results of the IA was discussed. MARSAME does not recommend clearance of M&E based on the results of the IA, but it is possible to make other disposition decisions based solely on the IA (i.e., limited number of judgmental measurements only). C. Bias proposed a flow chart describing this concept (see Figure 2). The Workgroup liked the idea of the flowchart, but decided additional thought was required to ensure that all options are considered properly.

MARSAME needs to try and develop guidance for a scan MQC similar to an MQC for laboratory samples described in MARLAP. If the scan MQC is less than the action level and representatives areas are scanned, less than 100% of the survey unit can be measured and still demonstrate compliance. However, survey unit size is now a consideration. Adjusting the

percent area to be surveyed is not a simple concept, and MARSAME should not be casual about this guidance. This is where most problems with survey designs occur. It may be possible to adjust the percent area to be measured based on estimates of total uncertainty and level of confidence in the final disposition decision. Assigning uncertainty to qualitative measures can be very subjective, so the goal of the guidance is to be as quantitative as possible. Additional conservatism is generally used to account for less quantitative data. It may also be possible to determine some guidelines using somewhat empirical methods to provide guidance for the percentage of M&E to be scanned.

MARSAME should include warnings on using logged data, since these data may not be independent. For example, logging data every tenth of a second instead of every second when the scan speed and height above the surface are kept constant over the same area does not provide 10 times as much information, just 10 times more data.

For Class 2 and Class 3 M&E, any hits above the action level brings the classification into question. Additional investigations should push the user towards 100% measurement. The Workgroup discussed the example of 100 buckets where each bucket contains 100 bolts. A Class 3 survey design may include 100% survey of three bolts from each bucket. If one of the bolts from the first bucket exceeds the action level, do you need to scan 100% of the 100 bolts in that bucket, or all 10,000 bolts? What if the bolt that fails comes from the 100^{th} bucket instead of the 1^{st}? The resulting investigation will be specific to individual surveys, but should start with a review of the IA to determine what led to the incorrect classification. The corrective action will be aimed towards preventing similar problems in the future.

TABLE OF CONTENTS

The Workgroup reviewed the table of contents for the current revisions of chapters in MARSAME. E. Boulos provided a handout describing a structure for MARSAME based on implementation rather than the DQO Process. This information was originally provided to the Workgroup at the May 2004 meeting. This handout will be converted into a checklist for designing surveys that can be included at the beginning of the Case Study appendix, and possibly included in Chapter 4, Chapter 1, or the Roadmap for MARSAME as well. Several comments were made on the structure handout and the table of contents for inclusion in the next revision of MARSAME.

ADJOURN

Meeting Date: September 29, 2004
Date Prepared: October 4, 2004

MULTI-AGENCY RADIATION SURVEY AND SITE INVESTIGATION MANUAL (MARSSIM) WORKGROUP MEETING NOTES

WEDNESDAY, SEPTEMBER 29, 2004

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U.S. Environmental Protection Agency - OSWER/ERT-West: C. Petullo
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MEMBERS OF THE PUBLIC:

Cabrera Services, Inc.: S. Hay (U.S. Air Force Contractor)

DISCUSSION

CHAPTER 1

The Workgroup reviewed revision 7 of Chapter 1. Individual comments from the comment database were discussed. Only major discussions concerning the document are described in these minutes.

The Workgroup agreed that the table describing physical and inferred measurements (see Figure 1) should be incorporated somewhere in Chapter 1, primarily to assist in the definition and description of measurability.

Following the review of glossary definitions it may be necessary to revise some of the definitions in Chapter 1. Authors are tasked with ensuring consistency between the glossary and the text.

K. Snead pointed out the use of terms such as disposition, disposition option, and alternative action can be confusing in MARSAME. For example, the phrase "an appropriate choice for disposition" may be clearer than "disposition option" on line 117. Disposition option could be applied to the alternative actions resulting from the performance of a disposition survey as well as the selection of future use options described in Chapter 2. Although the terms are used consistently throughout the supplement, the terms themselves don't seem to intuitively match the definitions. K. Snead and the Air Force contractor will try and resolve these issues for the next set of revisions to the chapters.

CHAPTER 3

The Workgroup reviewed revision 7 of Chapter 3. Similar to Chapter 1, individual comments from the comment database are not repeated in the minutes. There were no major discussions during the review of Chapter 3.

CASE STUDY 1, EXAMPLE 1

The Workgroup started reviewing example 1 from case study 1. The contractor described the structure of the case study, where there is an overall description of the site and three specific examples are developed to describe applications of the MARSAME guidance. The example has only been developed to reflect guidance through Chapter 3, since Chapters 4, 5, and 6 have not been developed.

The Workgroup discussed problems with the scenario of trying to survey building materials after the building was demolished. Many of the Workgroup members believed it is more likely the building would be surveyed and released prior to demolition, and discussed whether an abandoned building is real property (MARSSIM) or personal property (MARSAME). C. Bias described an alternate scenario for the case study where the floor is dug up for renovation or repair purposes. The concrete becomes personal property as soon as it is separated from the building, so this will not be an issue. The scenario becomes renovation, not decommissioning.

G. Powers pointed out that having an estimate of the maximum activity is critical to designing a disposition survey. Identifying radionuclides of concern and expected concentrations will impact the entire survey design process as well as survey implementation. Chapter 2 needs to spend more time discussing the importance of this type of information and how it can impact the survey design and implementation.

The review of Section 1.4 started a lengthy discussion on the difference between sentinel measurements and scoping surveys. The discussions in Section 1.4 were consistent with the guidance in Chapter 2 and the definitions in the glossary. However, the Workgroup was unsure if this application was consistent with the instructions from the Science Advisory Board Radiation Advisory Committee (SAB/RAC). The Workgroup members decided to consider examples of sentinel measurements and continue the discussion the next day.

ADJOURN

Meeting Date: September 30, 2004
Date Prepared: October 5, 2004

MULTI-AGENCY RADIATION SURVEY AND SITE INVESTIGATION MANUAL (MARSSIM) WORKGROUP MEETING NOTES

THURSDAY, SEPTEMBER 30, 2004

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MEMBERS OF THE PUBLIC:

Cabrera Services, Inc.: S. Hay (U.S. Air Force Contractor)

DISCUSSION

SENTINEL MEASUREMENTS

The Workgroup continued the discussion of sentinel measurements from the previous day.

A review of the notes from the SAB/RAC showed that the discussion on sentinel measurements was inconclusive, and the only statement the SAB/RAC had made was that sentinel measurements are judgmental measurements.

The Workgroup proposed several topics for further discussion on sentinel measurements:

- Sentinel measurements are taken prior to the categorization decision (i.e., prior to determining whether M&E are impacted or non-impacted).
- All sentinel measurements are judgment measurements.
- All judgment measurements are not sentinel measurements.
- Sentinel measurements are made in easily accessible areas to describe radiological conditions in difficult-to-access areas.
- Sentinel measurements are only applicable to Scenario B disposition surveys, and require documentation that the MDC is "low enough" at some specific level.
- Sentinel measurements are "lesser quality" measurements designed to help with the categorization decision.
- Sentinel measurements are only performed to support or verify process knowledge or existing information.
- Sentinel measurements may be qualitative or quantitative.

The Workgroup addressed two major concerns of the members for situations where everyone thinks the M&E are non-impacted, but can't be sure.

- Good quality process knowledge is available, so there is no incentive to perform sentinel measurements since there is nothing to gain from additional measurements (M&E are already non-impacted).
- Available process knowledge is less certain, a few lesser quality measurements could greatly impact the confidence in the categorization decision, but a non-impacted decision is forced through based on lower quality information to avoid the cost of performing a disposition survey.

The Workgroup discussed the difference between surrogate (alternate) measurements and sentinel measurements. Surrogate or alternate measurements measure one radionuclide to predict the concentration of another radionuclide. Surrogate measurements will be used in MARSAME to be consistent with MARSSIM. Sentinel measurements measure activity at one location to predict activity at a different, difficult-to-measure location.

C. Gogolak asked where smears come into this process. Smears are currently used to release M&E, so MARSAME needs to discuss how these measurements can or cannot be used. The Workgroup decided that smears are never quantitative. Smears can be sentinel (e.g., activity on smear indicates activity on M&E) and surrogate (e.g., gamma count Am-241 to predict Pu-239), but don't have to be either. MARSAME needs to clearly describe the terms sentinel and surrogate measurements, and that each of them can be qualitative or quantitative. An example of a surrogate sentinel measurement is using a FIDLER to measure an air filter over the intake to an engine. The Workgroup described this as a Class 3 Scenario B MARSAME survey consisting of one judgmental measurement.

E. Boulos provided a list of questions for the Workgroup to consider:

- What is the purpose of sentinel measurements?
- When is it appropriate to use sentinel measurements?
- How do people use sentinel measurements in impacted areas?
- How do people use sentinel measurements in non-impacted areas?
- Can sentinel measurements be used to confirm process knowledge for impacted areas?
- Can sentinel measurements be used to confirm process knowledge for non-impacted areas?
- How does a sentinel measurement differ from surrogate or judgmental measurements?

Following a discussion of these questions, the Workgroup drafted a purpose for performing sentinel measurements and a definition.

The purpose of sentinel measurements is to detect activity at one location to infer the presence of activity in difficult-to-measure locations. A sentinel measurement is a judgmental measurement of the activity in one location to evaluate the activity in a difficult-to-measure location.

Historical data can be of questionable quality. Sentinel measurements can be used to confirm process knowledge or historical data to support a non-impacted decision, although sentinel measurements alone cannot support a non-impacted decision. The sentinel measurements need to be of comparable or better quality than historical data. Sentinel measurements can be used during scoping and characterization to infer an upper bound of activity in difficult-to-measure locations, similar to a detection decision. The assumptions used to define the relationship between the sentinel measurement and the difficult-to-measure location need to be clearly stated.

GLOSSARY

The Workgroup reviewed revision 7 of the glossary. Similar to Chapter 1, individual comments from the comment database are not repeated in the minutes.

SCHEDULE

10/12/2004	Conference call from 11 to 1 (eastern) to discuss ISCORS meeting preparation (1 hour) and continue review of Case Study 1 Example 1 (1 hour). Call in number is 202-275-0170, and the code is 7435#.
10/18/2004	Conference call from 11 to 1 (eastern) to continue review of Case Study 1 Example 1. R. Meck will provide call-in information.
11/30/2004	MARSSIM meeting at EPA Region 2 in New York, NY. Two hours for glossary review, two hours of administrative discussions, and four hours reviewing Chapter 4.

12/1/2004	MARSSIM meeting, four hours reviewing Chapter 4, and fours hours reviewing Chapter 1 and Chapter 3.
12/2/2004	MARSSIM meeting, eight hours reviewing Case Study, or Case Studies.
12/3/2004	MARSSIM meeting, four or six hours reviewing Chapter 2, adjourn meeting in early afternoon.

ADJOURN

ACTION ITEMS

All	Review Case Study 1, Example 1 for discussion during conference calls.
K. Snead	Set up conference call for 10/12/2004. Twelve lines from 11 to 1 eastern.
	Discuss alternate terms to describe disposition option and alternative action with S. Hay.
	Post final minutes for the May MARSSIM meeting on the MARSSIM web site.
R. Meck	Set up conference call for 10/18/2004. Twelve lines from 11 to 1 eastern.
S. Hay	Discuss alternate terms to describe disposition option and alternative action with K. Snead.
	Finalize minutes from the May MARSSIM meeting and provide to K. Snead for posting on the MARSSIM web site.
	Prepare draft minutes from the September MARSSIM meeting.
	Prepare revision to Chapters 1 and 3, Case Study 1 Example 1, and Glossary for the December MARSSIM meeting.
	Prepare a draft of Chapter 4 for the December MARSSIM meeting.
	Prepare a revision of Chapter 2 for the December MARSSIM meeting.

PARKING LOT

Class 3 definition in MARSSIM may need adjustment to cover the "simple" case where the relative shift is very large, which may become the definition of Class 3.

Develop an FAQ on classification to decide when an area is Class 2 and not Class 1 or Class 3.

Given a classification of Class 2 or Class 3, provide a % scan to release. Determine whether scan coverage can be 0% in Class 3 areas.

Should MARSAME include prior knowledge (process knowledge) to design a disposition survey using a Bayesian approach?

Develop a range of expected values for radionuclide relationships that may be used for surrogate measurements.

Review the structure of Section 3.2.4.

Where are survey unit boundaries finalized, Chapter 3 or (new) Chapter 4?

Perform a pilot study to evaluate the MARSAME guidance. Suggested locations include Nellis AFB and Hunters Point Naval Shipyard.

Include the concept of "clean-as-you-go" in MARSAME.